

A NEW SPECIES OF GALAXIAS
(PISCES: GALAXIIDAE)
FROM THE SWAN RIVER, TASMANIA



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ABSTRACT

Galaxias fontanus sp. nov. is described. The species appears confined to the upper reaches of the Swan River in eastern Tasmania.

INTRODUCTION

The fragmented nature of the distribution of Tasmania's endemic galaxiid fauna was commented on by Andrews (1976), and since his revision of the family in Tasmania, further evidence of this has been documented. Three new species of galaxiids have since been described (McDowall & Fulton 1978; Fulton 1978), each of which is restricted in its distribution to a single lake or two adjoining lakes and their tributary streams.

However, all of the endemic species so far described with the exception of *G. cleaveri* Scott are found in the water-rich central and southwestern parts of the state. No endemic species have been recorded from the drier east coast region, hence the species described below is the first to be collected from this part of the state. It was found whilst electrofishing in creeks and streams crossed by newly constructed forestry roads.

METHODS OF STUDY

Specimens were examined using techniques similar to those of McDowall (1970) and Hubbs and Lagler (1958), except that fin ray counts include all segmented rays, branched or unbranched, and vertebral counts exclude hypural centra.

Specimens of *G. fontanus* used in the study were collected by electrofishing from the upper reaches of the Swan River in eastern Tasmania. Type material has been deposited in the following museums (the abbreviations as shown appear in the text):

AMS	Australian Museum, Sydney
IFCH	Inland Fisheries Commission, Hobart
QVML	Queen Victoria Museum, Launceston
TMH	Tasmanian Museum, Hobart

Measurements of all type material have been included in the study with details of the holotype given separately. All other specimens not designated as types are retained in the collection of the Inland Fisheries Commission, Hobart, under catalogue numbers GF.1-2.

MATERIAL EXAMINED

Swan River (type locality) (9 specimens), 27 January 1976 W. Fulton and R. Mawbey; Swan River (type locality) (21) 22 February 1978 W. Fulton and R. M. McDowall. Size range: 53 - 82 mm SL, mean 60 mm.

SYSTEMATIC DESCRIPTION

Galaxias fontanus sp. nov.
(Figures 1 and 2)

Types

Holotype. TMH 01317: 78 mm TL; collected 22 February 1978 by W. Fulton and R. McDowall from the type locality.

Type locality: Swan River, eastern Tasmania, where state forestry MG road crosses this river. (Tasmap 1:100000 series Break O'Day map sheet grid. ref. 8514-906 678. Lands Department of Tasmania.)

Paratypes. TMH (4) 01318-01321: Collected 22 February 1978 by W. Fulton and R. M. McDowall, type locality. QVML (4) 1978/5/72, QVM type 254: collected 22 February 1978 by W. Fulton and R. M. McDowall, type locality. AMS (4) AMS 1.20157-001: collected 22 February 1978 by W. Fulton and R. M. McDowall, type locality.

Etymology

The name *fontanus* is from the Latin meaning spring and refers to the probable origin of the Swan River.

Diagnosis

Differs from all other species of *Galaxias* by usually having an extra pore in the supramaxillary series (Figure 3). Differs from closely related species *G. johnstoni*, *G. pedderensis* and *G. olidus* in its more forward placement of the dorsal fin, fewer pectoral rays and the presence of well developed lateral canine teeth which are weak or lacking in the other three species. Differs from another closely related species, *G. brevipinnis*, in the absence of pyloric caeca and in having fewer dorsal, anal and pectoral rays and fewer vertebrae.

Description

A broad bodied species with wide head, markedly flattened between the orbits. Eye large with upper margin level with dorsal surface and lower margin at about half depth of head. Jaws about equal, gape wide and reaching almost to level with centre of eye. Snout blunt, broad and rounded, lips fleshy. Usually five pores in the supramaxillary series (very occasionally 6 or 4) the rest of the head pores as usual in *Galaxias* spp. (see Figure 3).

Dorsal and anal fins moderate in size with dorsal fins inserted about level or slightly in advance of anal fin origin. Paired fins of moderate size with pectorals inserted almost horizontally and very low in body profile. Very little fleshy thickening of the bases of any fins. Caudal peduncle deep, anal fin when adpressed covering part of caudal keel. Caudal fin only slightly indented.

Gill rakers short and blunt, 12 - 15 on first arch. Strongly developed lateral canine teeth in both upper and lower jaws, pyloric caeca absent.

Variation

For morphometric and meristic variation see Tables 1 and 2 respectively.

Colour

In life, light olive-green on back lightening down the sides to silver-white on the ventral surface. Sides and back are speckled with a light brown colour which may form fragmented bars or patches. In preservative, the fish are light grey in colour with darker grey speckled patches or broken bars on the back and sides with a pale grey to white ventral surface. There is little colouration in the fins in life or in preservative.

Size

The largest specimen yet seen measured 96 mm TL but most of the specimens examined were between 60 and 80 mm TL.

Life History

There has not been a detailed study of the life history of this species or any other endemic galaxiid in Tasmania. However, *G. fontanus* appears to be the only endemic Tasmanian member of the genus to be confined to a riverine environment. It probably passes its entire life in the river, as indicated by the presence of juvenile specimens (about 20 mm TL) at the type locality.

It therefore appears that spawning may take place at or near the normal adult habitat and that *G. fontanus* probably lacks the marine juvenile phase exhibited by the river-dwelling populations of other Tasmanian species, *G. brevipinnis* Gunther, *G. maculatus* Jenyns and *G. truttaceus* Valenciennes.

There was little development of the gonads of specimens collected in January 1976 or February 1978. However, eggs were visible in April 1978 specimens but the ovaries were not nearly fully developed. Hence it appears that spawning may not take place until late winter or spring.

Distribution

Specimens have been collected only from the upper reaches of the Swan River in the eastern part of Tasmania (see Figure 4). It may be present in some other branches of this river but was not found in any other nearby river systems or larger tributaries of the Swan River.

The short-finned eel, *Anguilla australis* Richardson, is also present at the collection site but the brown trout, *Salmo trutta* Linnaeus, although in most other nearby streams, was not collected with *G. fontanus*.

DISCUSSION

The new species appears most similar morphologically to *G. brevipinnis* in Tasmania or to *G. olidus* of mainland Australia but differences from both of these forms and other similar Tasmanian species as outlined earlier in the diagnosis are sufficient to justify its recognition as a distinct species.

The question of its origin is more difficult to explain as the species is amidst a virtual 'desert' as far as native fish are concerned. The east coast of Tasmania is the driest part of the state and most of its rivers have had periodic dry spells in recent times. Furthermore, brown trout are well established in most of the streams and they have been found to be

incompatible with galaxiid species of this type (Jackson 1975, Tilzey 1977). However, it appears that the Swan River system must have survived any droughts and access by trout has probably been prevented by the presence of Hardings Falls, approximately three kilometres downstream from the type locality on the Swan River, thus allowing the evolution and survival of *G. fontanus* in a virtually landlocked locality.

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TABLE 1 Morphometric variation in 30 *G. fontanus*. Values are percentages of standard length (SL) or head length (HL).

	Holotype	Range	Mean	S.D.
Length to caudal fork/SL	115.1	112.1 - 117.6	115.48	1.09
Total length/SL	117.4	115.5 - 120.4	117.67	1.20
Body depth at vent/SL	15.0	12.6 - 15.4	14.17	0.66
Depth caudal peduncle/SL	10.6	9.4 - 10.8	10.03	0.46
Length caudal peduncle/SL	15.3	14.4 - 17.8	15.68	0.94
Length dorsal fin base/SL	11.9	9.3 - 12.6	10.92	0.08
Maximum length dorsal fin/SL	17.9	16.8 - 20.1	18.23	0.82
Length anal fin base/SL	15.3	13.0 - 16.9	14.85	0.87
Maximum length anal fin/SL	20.0	18.4 - 22.9	20.40	1.06
Pectoral fin length/SL	15.1	14.0 - 17.8	16.03	0.96
Pelvic fin length/SL	14.1	12.7 - 16.0	14.32	0.75
Pre-dorsal length/SL	73.2	70.4 - 74.4	71.89	1.00
Pre-anal length/SL	73.4	70.7 - 73.9	72.37	0.96
Pre-pelvic length/SL	50.4	49.5 - 53.9	51.24	1.04
Pectoral-pelvic length/SL	28.1	27.5 - 30.8	29.16	0.98
Pelvic-anal length/SL	22.2	19.4 - 24.0	21.30	1.05
Head length/SL	25.3	23.0 - 26.3	24.75	0.92
Head width/HL	60.5	56.5 - 66.7	60.24	2.36
Head depth/HL	51.5	48.0 - 61.9	53.05	2.80
Snout length/HL	31.7	26.6 - 36.2	31.58	2.55
Post-orbital head length/HL	50.3	46.0 - 53.8	50.53	1.97
Inter-orbital width/HL	44.3	41.0 - 51.9	45.13	2.36
Eye diameter/HL	23.9	22.0 - 28.5	25.15	1.75
Length of upper jaw/HL	44.9	41.1 - 47.2	44.30	1.59
Length of lower jaw/HL	43.1	37.3 - 45.5	42.51	1.99
Width of gape/HL	38.2	37.0 - 45.5	40.41	1.81

TABLE 2 Meristic variation in *G. fontanus*. Values expressed are frequencies. An asterisk (*) denotes the value for the holotype.

	6	7	8	9	10	11	12	13	14	15	16	17	50	51	52	53
Dorsal fin rays		3	*22	5												
Caudal fin rays											3	*26	1			
Anal fin rays				1	2	17	*9	1								
Pectoral fin rays				1	18	10	*10									
Pelvic fin rays	1	*28	1													
Gill rakers						*8	11	3	5	3						
Vertebrae													1	9	8	2

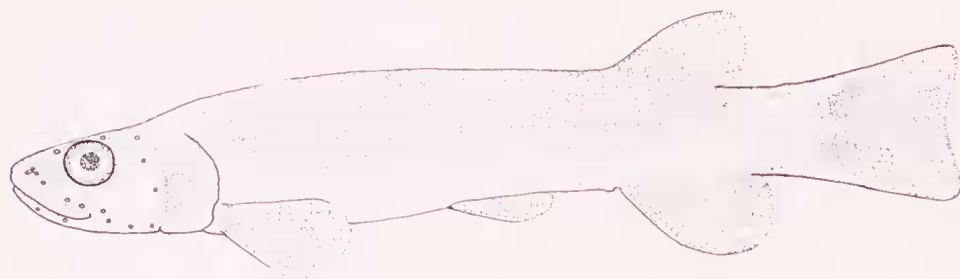
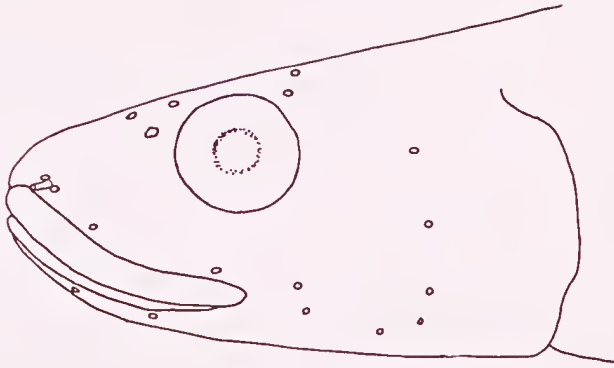


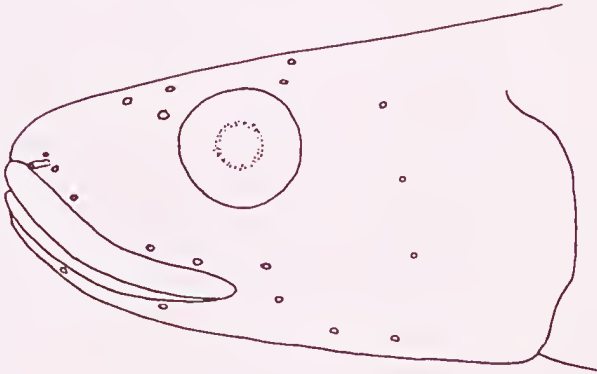
FIGURE 1 *Galaxias fontanus* sp. nov. holotype, Swan River, 78 mm TL.



FIGURE 2 *Galaxias fontanus* sp. nov. in life.



(A)



(B)

FIGURE 3 Distribution of laterosensory pores in (A) generalised galaxiid (B) *G. fontanus*.



FIGURE 4 Distribution of *G. fontanus* in Tasmania. (Only site indicated by ●.)